

RECEIVED  
CENTRAL FAX CENTER

AMENDMENTS TO THE SPECIFICATION:

AUG 24 2006

[00018] FIG 1 provides the steps of the process. The method begins with placing a metal with a metal temperature within a thermal control apparatus (110). The method continues by introducing a cryogenic material into the thermal control apparatus to decrease the carbide temperature, while preventing over-stressing of the metal (120). The temperature is then lowered to a first target temperature ranging from -40 degrees F and -380 degrees F at a first temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (130). The introduction of the cryogenic material can be stopped into the chamber once the first target temperature is reached (140). The chamber temperature to a second target temperature is increased ranging from 0 degrees F and 1400 degrees F. The metal temperature is increased to the second target temperature at a second temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (160). The method concludes by forming a treated metal without fractures (170), by placing a metal (10) within a thermal control apparatus (12). The metal (10) itself has a metal temperature (11). The thermal control apparatus (12) has a chamber (14) that has a chamber temperature (15).

[00028] FIG 3 depicts the process of the invention wherein the thermal process includes three thermal cycles resulting in a treated metal without fractures (28) and improved structural and metallurgical characteristics. The method of figure 3 begins with placing a metal with a metal temperature within a thermal control apparatus (110). The method continues by introducing a cryogenic material into the thermal control apparatus to decrease the carbide temperature, while preventing over-stressing of the metal (120). The temperature is then lowered to a first target temperature ranging from -40 degrees F and -380 degrees F at a first temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (130). The introduction of the cryogenic material can be stopped into the chamber once the first target temperature is reached (140). The chamber temperature to a second target temperature is increased ranging from 0 degrees F and 1400 degrees F. The metal temperature is increased to the second target temperature at a second temperature rate ranging from

0.25 degrees per minute and 20 degrees per minute (160). Cryogenic material is then introduced into the thermal control apparatus to decrease the intermediate carbide temperature, while preventing overstressing of the metal (220). The temperature is then lowered to a third target temperature ranging from -40 degrees F and -380 degrees F at a third temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (230). The method will then stop the introduction of the cryogenic material into the chamber once the third target temperature is reached (240). The chamber temperature is increased to a fourth target temperature ranging from 0 degrees F and 1400 degrees F. The metal temperature to the fourth target temperature is then increased at a fourth temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute. Additional cryogenic material is introduced into the thermal control apparatus to decrease the metal temperature, while preventing over stressing of the metal (320). The temperature to a fifth target temperature is lowered ranging from -40 degrees F and -380 degrees F at a fifth temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (330). The cryogenic material is stopped into the chamber once the fifth target temperature is reached (340). The chamber temperature to a sixth target temperature ranging from 0 degrees F and 1400 degrees F is increased (350). The metal temperature to the sixth target temperature is increased at a fourth temperature rate ranging from 0.25 degrees per minute and 20 degrees per minute (360). Finally a treated metal without fractures is formed (270).

Applicant believes that no new matter has been added with these amendments.